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LUKE
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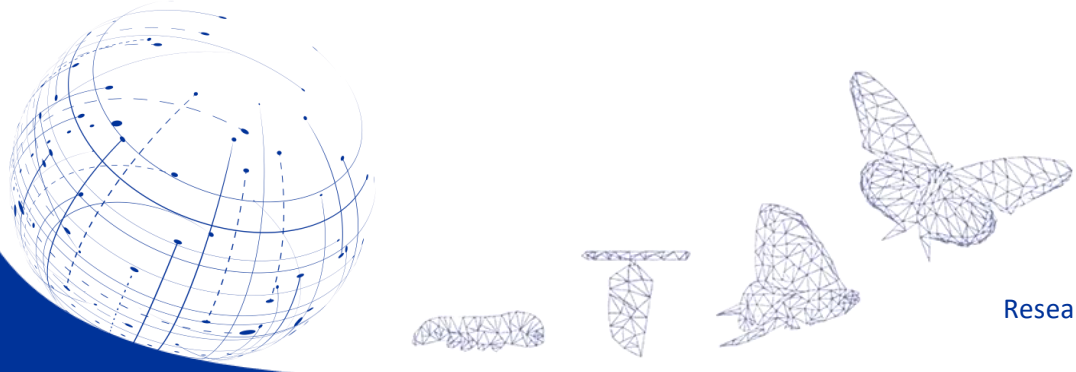
RESEARCH OFFERS AND REQUESTS FROM UKRAINIAN RESEARCHERS

Newsletter September 2025

Annex



Research and innovation cooperation
with added value

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RESEARCH OFFERS

Pre-crack initiation in ceramic samples

Research field: Fracture mechanics of ceramics.

Description of offer:
An innovative method of pre-crack initiation in ceramic samples for fracture toughness test.

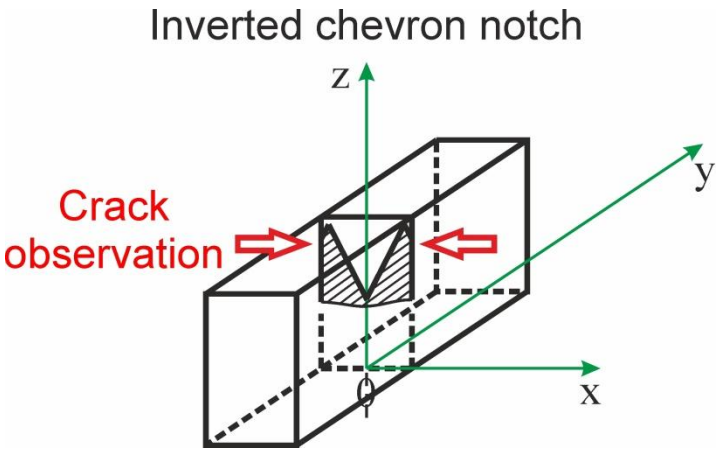
(i) machining a single-edge notch (inverted chevron) in a sample;
(ii) pre-cracks are initiated at chevron tips and propagate up to the chevron bottom under control on the sample side surfaces.

Advantages: The offer simplifies the test, spares time and costs.

Why us? Great possibilities to implement the offer.

Expected partners: University laboratories dealing with ceramics.

Picture of the invention:



Contact information:

Bogdan Vasyliv, Lviv Polytechnic National University, Lviv, Ukraine, mechengin1111@gmail.com

https://lpnu.ua/en/smsm

Photo-rechargeable electrochemical cells for light-driven energy generation and storage

Research field: Electrochemistry; Photochemistry; Renewable Energy Storage; Materials Science

Description of offer: First demonstration of a new device class: photo-rechargeable electrochemical concentration cells. Unlike batteries or solar cells, these systems autonomously recharge under visible light, combining energy conversion and storage in one unit. Our proof of concept with Zn–spiropyran shows cyclic operation with EMF shifts of 30 to 50 mV and microampere currents, reported at https://doi.org/10.1016/j.ijoes.2025.101005

The concept enables low-cost, modular and sustainable light-driven energy storage using abundant materials. We seek European partners to optimize membranes and solvents, scale arrays and integrate with PV or IoT devices. Collaboration may include Horizon Europe, EIC or MSCA proposals and hosting opportunities.

Advantages: Light-driven recharge without external power supply; low-cost design based on abundant zinc and simple components; modular and scalable to arrays; potential coupling with photovoltaics and IoT

Why us? Peer-reviewed proof of concept; expertise in photoactive dyes, dye-polymer composites and electrochemical devices; experience with device prototyping and testing

Expected partners: Universities and RTOs in electrochemistry, photochemistry and membranes; clean-tech SMEs; investors

Partner search for Horizon Europe Call: Open to Horizon Europe Cluster 5 Energy topics; EIC Pathfinder; MSCA Postdoctoral Fellowships or Staff Exchanges

Contact information:

Dr. Hennadii Bulavko, Taras Shevchenko National University of Kyiv, Kyiv, Ukraine; e-mail: gennadiybulavko@gmail.com

https://doi.org/10.1016/j.ijoes.2025.101005

Quantum Dots in Dielectric Metamaterials for Advanced Sensors

Reserch field: Materials science, photonics, nanotechnology, sensors

Description:

We create dielectric metamaterials with quantum dots (PbS, ZnSe, CdSe/ZnS) for fast, sensitive, and stable sensors across visible, IR, and THz ranges. Applications include industry, medicine, and telecom.

Advantages:

Ultrafast response, multi-spectral operation, high sensitivity, scalable use.

Partners sought: Researchers, industry, start-ups, investors with THz labs.

Horizon Europe calls: 101178082, 101189992

Contact information:

Zoya E. Eremenko, O. Ya. Usikov Institute for Radiophysics and Electronics, NAS of Ukraine, Kharkiv, Ukraine, zoya.eremenko@gmail.com

Oleksiy A. Breslavets, O. Ya. Usikov Institute for Radiophysics and Electronics, NAS of Ukraine, Kharkiv, Ukraine, alex.breslavets@gmail.com

https://www.ire.kharkov.ua/en/

Surface plasmon resonance biosensor with Kretschmann configuration

Description: Improvement of characteristics, enhancement of diagnostic and detection methods, creation of devices for biomolecule detection.

Applications: Industry, medicine, ecology

Advantages: High sensitivity, high accuracy of refractive index determination

Expertise: Knowledge in spectroscopy, modeling, sensors, nanomaterials

Expected partners: Researchers, industrial enterprises, investors, laboratories

Partner search references: 101184153, 101178082, 101189992

Contacts:

Zoya Eremenko, Kharkiv, Ukraine, zoya.eremenko@gmail.com

Serhii Kulish, Kharkiv, Ukraine, s.kulish@khai.edu

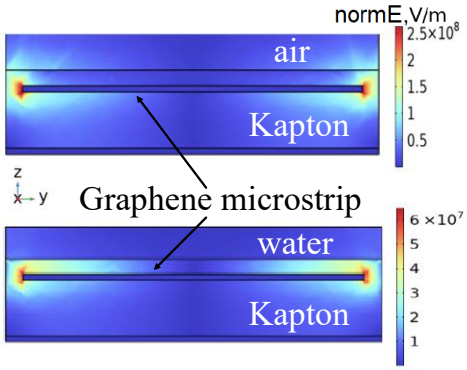
Rostyslav Terekhov, Kharkiv, Ukraine, r.s.terekhov@gmail.com



https://www.ire.kharkov.ua/en/ https://khai.edu/en/

Terahertz metasurface sensors for biosensing and environmental monitoring

Research field: Photonics, nanomaterials, biosensing
Research, service, development and technology request: Joint research and technology validation
Description of offer: We modelled in COMSOL terahertz metasurface sensors exploit plasmon resonance modes in graphene-dielectric structures for biomedical diagnostics and environmental monitoring.
Advantages: High sensitivity, tunability, compact
Expected partners: Researchers, industries, start-ups in biosensing, nanotechnology, photonics
Partner search for Horizon Europe Call: HORIZON-CL4-2025-04-DIGITAL-EMERGING-01
Portrait, team picture or picture of the invention



Electric field distribution in the cross section of the unit cell of the metasurface without analyte (air) and with water on the metasurface

Contact information:

Zoya Eremenko, IRE NASU, Kharkiv, Ukraine
zoya.eremenko@gmail.com

Kateryna Kuznetsova, IRE NASU, Kharkiv, Ukraine
tkachenkok89@gmail.com

Protective coatings with improved performance

Research field: Materials Science, Surface Engineering

Description of offer:

Research for the best coating solutions, service on coatings deposition, development of materials for coatings, technology of coatings deposition

Development of protective coatings with improved wear-, oxidation- and heat resistance, thermal barrier and abradable coatings, bio-compatible coatings.

Advantages:
We provide the best coating solutions to address our customers' needs.

Why us? We have great experience in developing coatings for the aerospace, automotive, gas turbine industries and for medical applications.

Expected partners:
Researchers, Industries, Start-ups, Investors

Contact information:
Maksym Ukrainets, Department 49 of Frantsevich Institute for Problems in Materials Science NASU, Kyiv, Ukraine, m.ukrainets@ipms.kyiv.ua

http://www.materials.kiev.ua/science2.0/structure/department.jsp?id=51

Ti-based powder rolling materials with additives of refractory compounds SiC, B_4C and TiC for aviation, aerospace and automotive industry

Research field: Powder metallurgy

Description of offer: Study of titanium powder rolled products doped with nanopowders of refractory compounds (SiC, B_4C, TiC) by the method of asymmetric rolling to obtain high-strength titanium-based materials.

Advantages: Powder technologies make powder mixtures with any given amount of alloying components, in contrast to the technologies of melting alloys.

Why us? Experience in obtaining compact powder materials by rolling method.

Expected partners: Researchers and companies of powder metallurgy.

Contact information:
Yurii Fedoran, Frantsevich Institute for Problems of Materials Science, Kyiv, Ukraine, y.fedoran@ipms.kyiv.ua

http://www.materials.kiev.ua/science2.0/structure/department.jsp?id=13

Mobile platform for functional foods

Field: Food Technology

Description:

A modular line with ultrasound-assisted energy-efficient grinding, drying, extraction and pulsed injection.

Products: Functional, nitrite-free products for field/stationary use.

Advantages: Mobility; energy efficiency; preservative-free; added value for wounded/vulnerable groups.

Why us? Cherkasy State Technological University – expertise in ultrasonics and modeling; laboratory prototype available.

Expected partners: WantedVegan, LLC “KR Ingredients”, Globinsky Meat Processing Plant LLC, meat and plant product manufacturers, medical and military institutions, research centers.

Horizon Europe: FARM2FORK-03, CIRCBIO-12.

Contact:

Olexandr Batrachenko, Cherkasy State Technology University, Cherkasy, Ukraine, avbatrachenko@gmail.com , +38-098-792-93-25

Ethical and safe use of LLMs in psychological support

Research field: AI, Mental Health

Research, service, development and technology offer: Research

Description of offer: Elomia Health proposes joint research on the ethical and safe deployment of LLM for psychological support.

Advantages: Evidence-based AI with published results, dataset of 5M+ messages, proven effectiveness in real users, 5 years' experience.

Why us? Expertise: Collaboration track with Stanford and University of Pennsylvania; long-standing focus on AI mental health; clinical team with expertise in generative AI.

Expected partners: Universities, research groups, mental health organizations.

Partner search for Horizon Europe Call:

Portrait, team picture or picture of the invention:

≈ Elomia Health

Contact information:

Anastasiia Knysh, anastasiia@elomia.com

www.elomia.com

Khimichymo – inspiring hands-on STEM education for children

Research field: STEM Education, EdTech, Science Communication, Social Innovation

Description of offer:

Development of hybrid STEM education tools for children aged 6–12: live workshops, DIY experiment kits, online courses, and an upcoming AR mobile app. Scalable and adaptable formats for schools, families, and digital platforms.
Khimichymo inspires curiosity and creativity by combining hands-on experiments with digital solutions and cultural relevance. Current products include workshops, camps, and experiment kits; under development are a mobile AR app, an experiment book, and a science board game. Future modules will focus on renewable energy.

Advantages:

- Hybrid model (offline + online + AR)
- Affordable, localized and culturally relevant content
- Scalable via digital subscriptions, kit exports, and franchised workshops
- Strong social impact: nurturing a generation of curious, confident innovators in Ukraine and beyond

Why us? Founded by a PhD in Chemistry with international teaching experience. Early traction includes hundreds of children engaged, partnerships with schools, libraries, and science centers. Direct demand from parents and educators validates the need.

Expected partners: Investors, EdTech companies, NGOs, research institutions, schools, Horizon Europe consortia.

Partner search for Horizon Europe Call: Cluster 2 (Culture & Creativity) and Cluster 4 (Digital, Industry & Space) – STEM education & EdTech collaborations.

Contact information: Khimichymo, Valentyna Levchyk, PhD, Department of Analytical Chemistry, Faculty of Chemistry, Taras Shevchenko National University of Kyiv, Kyiv, Ukraine, valentynalevchyk@gmail.com
http://ximi4imo.tilda.ws/

Media expertise, production services

Research field: Media, Communication

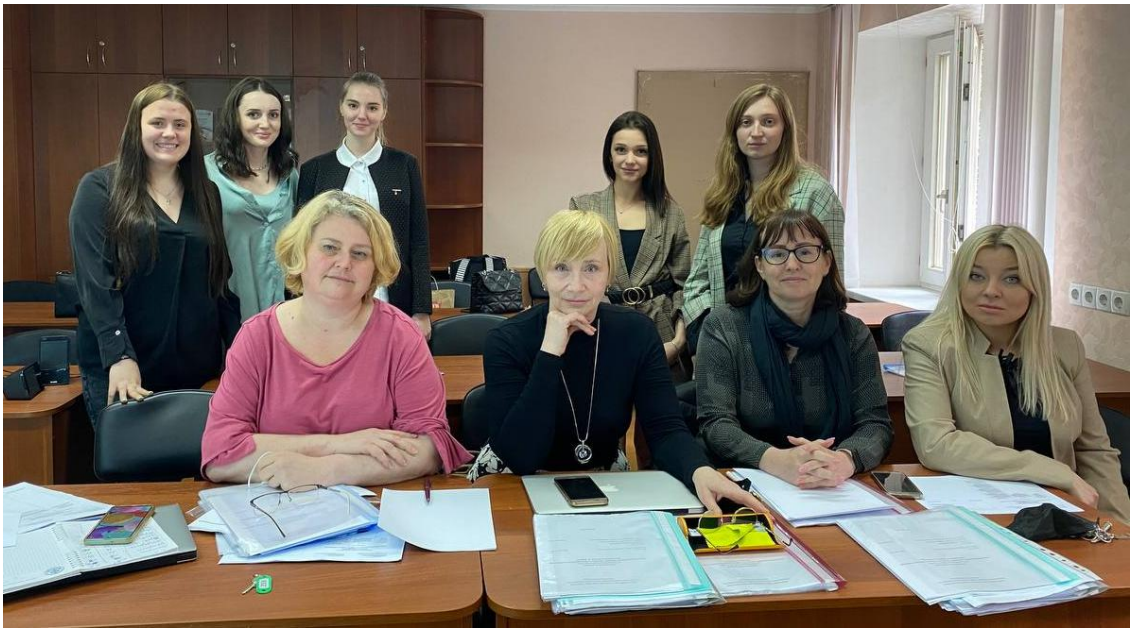
Research, service, development and technology offer: Research, Service

Description of offer: Our team offers comprehensive professional services, including full-cycle media content production, various types of research (sociological, communication, and media analysis), and organising educational training

Advantages: You gain access to a full suite of media services from a single academic partner

Why us? Our team has experience in the media and includes certified specialists in pedagogical, economic, philological, and sociological sciences. We are equipped to provide innovative solutions based on a blend of academic knowledge and practical skills

Expected partners: Foreign academic institutions



Contact information:

Kateryna Yaresko, Business Journalism and Digital Media Department, S. Kuznets Kharkiv National University of Economics, Kharkiv, Ukraine, kafmedia@hneu.edu.ua

http://www.kafusk2.hneu.edu.ua/

Training course: Gas Chromatography from theory to practice

Research field: Analytical chemistry, chromatography

Description: We provide practical training in gas chromatography, from column selection factors to column installation and chromatogram acquisition. The course is developed and delivered by experts from Taras Shevchenko National University of Kyiv.

Advantages: Hands-on approach, work with equipment, certificate of completion.

Why us? Experienced chemists and university lecturers, 15 years teaching experience, long-term cooperation with industry labs.

Expected partners: Universities, pharma companies, analytical labs.

Contact information: Oksana Tananaiko, Valentyna Levchyk, Department of Analytical Chemistry, Faculty of Chemistry, Taras Shevchenko National University of Kyiv, Ukraine, tananaiko@knu.ua and valentynalevchyk@gmail.com

Training course: Liquid Chromatography methods and applications

Research field: Analytical chemistry, chromatography

Description: We offer applied training in liquid chromatography covering method development, instrument setup, and real-case applications in pharma, food safety, and environmental control. Training is conducted by specialists from Taras Shevchenko National University of Kyiv.

Advantages: Combination of theory and practice, industrially relevant case studies, certification provided.

Why us? Strong academic background, 15 years teaching experience, practical collaboration with quality control laboratories.

Expected partners: Research institutions, biotech and pharma industries, start-ups.

Contact information: Oksana Tananaiko, Valentyna Levchyk, Department of Analytical Chemistry, Faculty of Chemistry, Taras Shevchenko National University of Kyiv, Ukraine, tananaiko@knu.ua and valentynalevchyk@gmail.com

RESEARCH REQUESTS

Experimental testing of dielectric metamaterials with quantum dots for sensor applications

Research field: Materials science, photonics, nanotechnology, terahertz technologies, sensor systems

Description of request:

We request access to experimental facilities and expertise for testing dielectric metamaterials with embedded quantum dots (PbS, ZnSe, CdSe/ZnS) in the THz and optical ranges.

Our team has developed a concept of advanced metamaterial-based sensors with enhanced luminescence and resonance properties. To validate their performance, we seek partners with laboratories capable of precise optical and THz measurements. This will allow us to demonstrate ultrafast, multi-spectral, and highly sensitive sensor operation for industrial, biomedical, and telecommunication applications.

Expected providers, partners: Research institutions, laboratories, industries, and start-ups with THz/optical testing facilities; investors for technology scaling.

Contact information:

Oleksiy A. Breslavets, O. Ya. Usikov Institute for Radiophysics and Electronics, NAS of Ukraine, Kharkiv, Ukraine, alex.breslavets@gmail.com

Zoya E. Eremenko, O. Ya. Usikov Institute for Radiophysics and Electronics, NAS of Ukraine, Kharkiv, Ukraine, zoya.eremenko@gmail.com

https://www.ire.kharkov.ua/en/

Development, fabrication and experimental testing of surface plasmon resonance biosensors based on the Kretschmann configuration and hybrid nanostructures

Request description:

We request access to technological and experimental equipment for the fabrication and testing of surface plasmon resonance biosensors based on the Kretschmann configuration and hybrid nanostructures (MXene, graphene, silver) in the infrared, terahertz, and optical ranges.

Our team has developed a concept of advanced surface plasmon resonance biosensors with enhanced sensitivity for the diagnostics of biomaterials and gases. To validate their performance, we are seeking partners with laboratories capable of fabricating and conducting optical and terahertz measurements of sensor parameters. This will allow us to demonstrate ultrafast and highly sensitive operation of the sensors for industrial, biomedical, and environmental applications.

Expected suppliers and partners:

Research institutes, laboratories, industrial enterprises, and startups equipped for testing in the terahertz, optical, and infrared ranges; investors interested in scaling these technologies.

Contact Information:

Zoya Eremenko, Usikov Institute of Radiophysics and Electronics, NAS of Ukraine, Kharkiv, Ukraine, zoya.eremenko@gmail.com

Serhii Kulish, Usikov Institute of Radiophysics and Electronics, NAS of Ukraine; National Aerospace University “Kharkiv Aviation Institute,” Kharkiv, Ukraine, s.kulish@khai.edu

Rostyslav Terekhov, Usikov Institute of Radiophysics and Electronics, NAS of Ukraine, Kharkiv, Ukraine, r.s.terekhov@gmail.com

https://www.ire.kharkov.ua/en/

https://khai.edu/en/

Collaboration on experimental validation of terahertz metasurface biosensors

Research field: Photonics, advanced materials, terahertz technologies, biosensing

Description of request:

Request for joint research and technology validation

We propose graphene-based terahertz metasurface sensors with high sensitivity (1.6 THz/RIU) for biomolecule detection. Modeling is performed in COMSOL Multiphysics and relies on experimentally determined dielectric parameters of liquids measured by differential dielectrometry, verified by molecular dynamics and UV-Vis spectroscopy. This integration ensures reliable predictions and practical applicability. The sensors exploit localized resonant modes in graphene-dielectric structures, where analytes shift the spectrum, enabling compact, tunable and cost-effective devices for biosensing and environmental monitoring.

Expected providers, partners: Universities, research institutes, photonics labs, biomedical companies, start-ups

Contact information:

Kateryna Kuznetsova, O.Ya. Usikov Institute for Radiophysics and Electronics, Kharkiv, Ukraine, tkachenkok89@gmail.com

Zoya Eremenko, O.Ya. Usikov Institute for Radiophysics and Electronics, Kharkiv, Ukraine. E-mail: zoya.eremenko@gmail.com

Google Scholar profiles:

Zoya Eremenko https://scholar.google.com/citations?user=O-P2pmEAAAAJ&hl=en

Kateryna Kuznetsova https://scholar.google.com/citations?user=LQ4OxiwAAAAJ&hl=en

Investigation of the wear behaviour and heat resistance of coatings. Development of materials for coating deposition

Research field: Materials science, powder metallurgy, coatings

Description of request:

We are looking for partners with strong expertise in Horizone-Europe funding programmes to form a consortium for upcoming calls. We have the expertise, equipment and personnel to produce various thermal (plasma, detonation and cold) or electro-spark deposited coatings for extreme applications.

Expected providers, partners: researchers, Industrial Partners.
Partnerships under Horizone-Europe Calls

Contact information: Maksym Ukrainets, Department 49 of Frantsevich Institute for Problems in Materials Science NASU, Kyiv, Ukraine, m.ukrainets@ipms.kyiv.ua
http://www.materials.kiev.ua/science2.0/structure/department.jsp?id=51

High-performance copper composite for MIG/MAG welding contact tips

Research field: Materials science

Description of request:

Our team developed a copper–graphite composite for MIG/MAG welding tips. Preliminary tests show it has several times higher durability than conventional tips. Nevertheless, both the material and its fabrication method require further optimization to achieve reliable performance, scalable production, and enhanced cost-effectiveness.

Expected providers, partners: R&D institutes and manufacturing companies in powder metallurgy and welding

Contact information: Oleksii Bezdorozhev, Frantsevich Institute for Problems of Materials Science, Kyiv, Ukraine, o.bezdorozhev@ipms.kyiv.ua

www.materials.kiev.ua

Synthesis of endofullerene-like structures based on boron nitride containing metals or metal nitrides under concentrated light in nitrogen flow

Research field: Nanomaterials

Description of request:

Advanced synthesis methods for endofullerene-like structures.
The aim is to reproduce the synthesis in collaboration with partners, carry out further structural and functional characterization.

Expected partners:

- Research institutes with advanced synthesis facilities specialized in BN
- Industrial centers interested in hydrogen technologies, gas separation, catalysis.

Contact information:
Lina L. Sartinska
Frantsevich Institute for Problems of Materials Science, NAS of Ukraine
Kyiv, Ukraine
l.sasrtinska@ipms.kyiv.ua

https://orcid.org/my-orcid?orcid=0000-0002-0555-1165

Study of structure and properties of Al and Ti-based materials

Research field: Materials science

Description of request: Study of the properties of Al and Ti-based materials.

Expected partners: Materials science researchers and aviation, aerospace and automotive industry companies

Contact information: Yurii Fedoran, Frantsevich Institute for Problems of Materials Science, Kyiv, Ukraine, y.fedoran@ipms.kyiv.ua

http://www.materials.kiev.ua/science2.0/structure/department.jsp?id=13

Ethical frameworks for the inclusion of displaced researchers

Research field: Bioethics, Migration Studies, Science Policy, Humanities and Social Sciences

Description of request:

We seek collaboration in developing ethical and methodological tools to analyze the integration of displaced Ukrainian researchers in Germany and the EU

Our project investigates the ethical challenges of forced academic migration and aims to design a Framework for Ethical Inclusion in Academia. We are looking for partners with expertise in migration policy, higher education governance, bioethics, and digital research tools. Collaboration may include joint workshops, comparative studies, or contributions to policy recommendations

Expected providers, partners: Universities, research centers, NGOs, migration think tanks, Horizon Europe consortia

Contact information: Dr. Hanna Hubenko, FAU, Germany; NGO Bioethics, Ukraine

hanna.hubenko@gmail.com

Partnership on local governance and human rights research

Research field: Social Sciences, Law, International Law, Municipal Law, Constitutional Law, Governance, Human Rights

Description of request:

Seeking collaborators to explore the evolving role of local governance, including municipal standards of the Council of Europe, and its impact on human rights at national and Council of Europe levels. Focus on practical governance solutions and policy impact.

This request aims to investigate how local authorities adapt to modern challenges, leveraging Council of Europe standards to enhance human rights protection. We seek to develop actionable policies through interdisciplinary collaboration, addressing gaps in national frameworks. Ideal partners will bring expertise in governance, policy analysis, or human rights implementation. Open to Horizon Europe opportunities for broader impact.

Expected partners: Researchers, NGOs, policymakers, Horizon Europe participants.

Contact information: Natalia Mishyna, SAGE Laboratory, Strasbourg, France,
natalia.mishyna@unistra.fr

https://www.linkedin.com/in/natalia-mishyna/

LUKE PROJECT PARTNERS

Project coordinator

DLR Projektträger
Germany

Responsible for implementation of the capacity building

ZENTRUM FÜR SOZIALE INNOVATION
CENTRE FOR SOCIAL INNOVATION
ZSI
Austria

DEMOCRACY X
TECHNOLOGY, SOCIETY & SUSTAINABILITY
Denmark

civitta
Ukraine
Lithuania

Ukraine

Ukraine

IHTEI
Ukraine

Ministries

MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE
Ukraine

Federal Ministry of Research, Technology and Space
Germany

Romania

R&I Funding Agencies

NATIONAL RESEARCH FOUNDATION OF UKRAINE
Ukraine

T A
C R
Czechia

FWF Austrian Science Fund
Austria

FFG Promoting Innovation.
Austria

Latvian Council of Science
Latvia

Estonian Research Council
Estonia

NATIONAL SCIENCE CENTRE POLAND
Poland

UEFISCDI
Romania

ANCD
Moldova

Georgia

TÜBİTAK
Türkiye

Associated partners:

DFG Deutsche Forschungsgemeinschaft
German Research Foundation
Germany

Swiss National Science Foundation
Switzerland

Research Council of Finland
Finland

GEORGIA'S INNOVATION & TECHNOLOGY AGENCY
Georgia